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Rural areas in Texas are being rapidly developed and urbanized, especially in the central and southwest parts of the state. Many urban dwellers want to escape to the country to live a quiet, peaceful life or enjoy recreational opportunities on their own land. As a result, large tracts in rural areas are being divided into properties of 5 to 100 acres; many are fewer than 20 acres.

New rural landowners almost always want to maintain or obtain an ad valorem tax exemption, which is most often granted for agricultural use of the land. They often decide to start livestock enterprises to meet tax exemption requirements. However, most taxing authorities require one to demonstrate that such an enterprise is economically viable. In other words, owning one animal as a family pet will not qualify property for the tax exemption. This publication identifies the three livestock enterprises best suited to small acreages and most likely to be profitable.

These three enterprises require:

- minimal facilities (both in construction, expense and space required);

- minimal labor (both time and physical effort); and
- minimal animal husbandry expertise.

They also have readily accessible markets for excess production or unwanted animals.

The most important concern of any landowner, big or small, is good stewardship of the land. The three livestock enterprises discussed here are the most environmentally compatible with small acreages. Livestock enterprises almost always depend, at least to some degree, on having forage for the animals to eat. As a livestock producer, forage is your primary product. No livestock enterprise can be economically viable for long if grazing destroys the forage growing on the land.

Determining Stocking Rate

Because livestock enterprises depend upon forage, the most critical decision you may make is the appropriate stocking rate for your land. Stocking rate is the number of animals per unit area of land. It is typically expressed as acres per animal unit. An animal unit consumes 26 pounds of forage daily.

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For an example, look at the listings in Table 1. One 80-pound ewe of a hair sheep breed equals .12 animal unit equivalent. So, eight ewes are one animal unit (meaning that eight ewes consume about 26 pounds of forage daily). If you own 20 acres, but only 10 acres produce forage for grazing, you would need to determine how many pounds of forage those 10 acres were producing to know how many ewes you could graze on the land. Small acreage landowners usually overestimate the carrying capacity (sustainable stocking rate) of their property.

Table 1. Animal Unit Equivalents (AUE).		
Kind and class of livestock	Approximate AUE*	No. of head per AU
Hair Sheep, 80-lb. ewe	.12	8
Hair Sheep, 40-lb. weaned lamb	.06	17
Hair Sheep, 125-lb. ram	.17	6
Goat, 100-lb. doe	.15	7
Goat, 45-lb. weaned kid	.07	14
Goat, 180-lb. buck	.24	4
Cattle, 500-lb. stocker calf	.6	1.7
Cattle, 1,000-lb. cow	1	1
Cattle, 1,800-lb. bull	1.7	.6

Landowners who graze too many animals for a long period of time will destroy the productivity of their land. Overgrazing has these consequences:

- Desirable, nutritious plants disappear and undesirable plants multiply, so animals do not perform well without costly supplemental feed.
- With the loss of native range plants, rainfall can not percolate into the ground easily and tends to run off. Run-off causes soil erosion and pollutes surface water. The regeneration of just 1 inch of topsoil will require several lifetimes.

Each property is unique, with different soil types, topography and plants. Therefore, general recommendations for appropriate stocking rates or carrying capacities are not included here. You will need help to determine your stocking rate accurately. Contact your county Extension agent or a representative of the Natural Resource Conservation Service. These professionals have guides to the forage production capacity of every county in Texas, and can help you determine the amount of forage your land is likely to produce. They will advise you about the number of acres of your land that will be required to support an animal unit with minimal supplemental feed.

Enterprise #1. Stocker Calves

For this discussion, stocker calves are either 1) weaned calves of suitable age and body condition for a grazing program, or 2) heifers with brood cow potential, grazed from weaning (at least 4 months old) to yearling age (12 to 14 months old). Feeder calves, in contrast to stockers, are weaned calves bound for a feedyard because of their weight, age, body condition and/or the market conditions. (An example of a feeder calf would be a fat steer weighing more than 650 pounds.)

Cattle prefer grass rather than browse (trees and shrubs) or forbs (weeds). If your acreage has mostly grass, cattle should do well. However, if you don't have enough forage to support at least eight to ten stockers for at least 4 months, you shouldn't choose this enterprise.

In a stocker calf enterprise, your primary product is the forage (grass) and you sell that product



by marketing calves you own and have grazed, or by allowing others to graze their animals on your land. A stocker calf enterprise offers these benefits:

1. **Flexibility.** Landowners do not have to own the cattle. When grass is available, grazing can be leased to someone who is willing to pay to graze their stockers on your property. Selling grass usually incurs less risk than buying cattle.

2. Minimal facility requirements. Stockers can be grazed without an investment in large facilities and handling equipment, unlike a perennial cow/calf operation. The minimum requirement is a small pen or corral from which calves can be loaded into a trailer. Portable cattle panels can be used instead of permanent facilities.

The property should have a permanent perimeter fence constructed with at least five barbed wires, with the top wire at least 50 inches above the ground. Seven barbed wires or 48-inch net wire with two barbed wires above it would be preferred. Barbed wires above the net wire should be either close together (less than 2 inches apart) or far apart (at least 6 inches apart) so they will not catch the leg of a jumping deer. Electric fencing is suitable for internal partition fences but not for a perimeter fence.

The health of incoming calves is of paramount importance to any stocker operator, but especially to the small acreage landowner. A lack of handling facilities combined with inexperienced caretakers could result in a disaster. Ideally, a group of calves would come directly from the ranch where they were born, preferably from within the county or from an adjacent county. Calves from several sources, or from a commission company, are more likely to incur health problems.

Heifer development is a very viable enterprise for small acreages. Many central Texas cow/calf producers have a 1-1-1 operation—one herd, one bull, all in one pasture. As a result, it is difficult for them to develop replacement heifers. The small acreage owner could establish a cooperative agreement with such a producer to pasture weaned heifers for 6 to 8 months and then return them to their owner. An attractive part of this arrangement is the well defined grazing period.

How to begin

Before looking for stocker calves to pasture, the landowner should decide on an appropriate, yet negotiable, price for the pasture and management services provided. The simplest arrangement is to sell the grazing rights and let the owner of the cattle be responsible for their management. Grazing can be priced several ways, including 1) cents per pound of weight gain, 2) dollars per head per month, or 3) dollars per hundredweight of initial weight. The simplest plan is a fixed rate per head per month. With this arrangement no scales are required and the profit or expense can be calculated easily by all parties involved. In general, the monthly pasture charge for calves ranges from \$5 to \$15 per head. If you include management ser-

vices such as monitoring water supply, distributing salt, or putting out mineral supplements, supplemental feed or hay, you would charge more. The time required to perform these services depends upon the equipment you have, the size and arrangement of your pastures, and the number of stocker calves involved.

When you are ready to begin, you will need to make contact with cattle producers who need pasture. Newspaper ads and notices posted at feed stores and livestock commission companies can help. Large animal veterinarians and county Extension agents might also help put you in touch with cattle producers.

Why not cows?

Some might wonder why a typical cow/calf operation would not work on small acreage. There are several reasons.

- An 1100-pound cow will consume 22 to 33 pounds of forage or $\frac{1}{2}$ a square bale of grass hay each day. If a typical stocking rate for native range is 25 acres per animal unit, then 100 acres might support only four animal units, assuming all 100 acres produce grass and are grazable.
- It is not economically feasible to own a bull for fewer than 10 to 15 cows. Bulls require even more feed than cows and are hard on facilities and fences.
- A cow/calf enterprise is not flexible. When drought reduces available forage, producers must either buy expensive feed or sell some cows to prevent overgrazing. This is the time when cattle prices are lowest. Then, after rains have come and grass has grown, producers buy more cows when prices are highest. With a sell low/buy high strategy, an operation can not be economically viable.
- Facilities for managing large animals are expensive and reduce the acreage available for grazing.
- A cow/calf operation requires considerable animal husbandry skill. A beef cow represents a \$400 to \$1000 investment. Naturally, the owner is economically and humanely compelled to care for the animals, but illnesses, injuries, birthing complications and preventive health programs often intimidate the inexperienced producer. Veterinary services can be expensive. Animals must be transported to a veterinary clinic in a trailer (another investment) or the producer must find a veterinarian willing to make "house calls."

Enterprise #2. Meat Goats

Because of their relatively small size, goats are even better suited to small acreage operations than cattle. Goats eat more browse plants than other domestic livestock do. Therefore, they are the best species for managing or sculpting woody plant habitats. Unfortunately, plants such as juniper or mesquite are very low on a goat's list of preferred plants, so do not count on goats to manage these "undesirable" plants. Do not expect goat browsing to eliminate juniper more than 4 feet tall.

Breeds for meat goat production include:

Boer. This breed was originally developed in South Africa and imported in 1993. Animals have mostly white bodies with dark red heads and white blazes on their faces. Boer goats are docile and easy to handle. Both sexes are horned.

Spanish. The breed characteristics of Spanish goats are not well defined. Their color ranges from black to white and their mature weight ranges from 60 to 130 pounds for does and from 90 to 250 pounds for bucks. As a breed, Spanish goats are hardy and adapt well to rough terrain. Of the breeds mentioned here, they are the least docile.



Dairy. Dairy breeds such as Nubian, Saanen, Alpine and LaMancha can be raised for meat. However, because they were bred for milk production, some individuals have an udder conformation that is not conducive to pasture conditions and nursing kids. This makes dairy type goats less suitable for a meat goat operation. Dairy goats are docile. If not disbudded, many dairy goats will have horns.

Pygmy. This is the smallest of the goat breeds. Most pygmy goats are less than 30 inches tall at the shoulder and weigh less than 80 pounds. Bred primarily as a novelty and for exhibition, their small size, docility and low nutrient requirements make these goats well suited to small acreages. They are marketed as pets or breeding animals, or for meat.

Enterprise #3. Hair Sheep

Hair sheep breeds are also produced for meat. They are generally smaller than wool sheep breeds, which makes them more suitable for small acreages. They are also more tolerant of internal parasites. Most wool sheep must be shorn at least once a year. Hiring an experienced shearing crew and marketing small quantities of wool can be difficult chores for the small producer.

Sheep prefer forbs (weeds) and grass. Some weeds, such as ragweed, nightshades, thistles, broomweed and prairie coneflower, are not palatable and will not be controlled by grazing. Some plants are toxic (for example, johnsongrass after a frost and silverleaf nightshade) and can kill an animal if eaten in large quantities.

Breeds of hair sheep include:

Barbado. This breed was developed in Texas and is the most popular breed in the state. It was developed by crossing the Barbados Blackbelly



with the Rambouillet and mouflon. These sheep have tan or brown bodies with black bellies and legs. They are very prolific. Males are horned and females are polled.

Barbados Blackbelly. This breed is similar to the Barbado. Both sexes are polled.

Dorper. A cross between the Blackheaded Persian and the Dorset Horn breeds, Dorper sheep are either solid white or white with black heads. They are very docile. Both sexes are polled.

St. Croix. Also known as the Virgin Island White, these sheep are white, docile, and have a strong flocking instinct.

Katahdin. This is a cross of the “African Hair Sheep” with domestic U.S. sheep, primarily the down breeds. They are white to light tan, very docile, and have a moderate flocking instinct.

Goat and Sheep Management

Facilities

Predators are the biggest problem in sheep and goat production. As rural areas are developed, predation from bobcats and foxes probably will decrease, but coyotes, unconfined dogs, and feral hogs will be an increasing threat.

Barbed wire alone is not suitable for goat or sheep fencing. Perimeter fencing should be 39- to 48-inch net wire, with vertical stays of the net wire spaced 12 inches apart to prevent horned animals from getting caught in the fence. Where there is a significant predator problem, vertical stays 6 inches apart will form a better barrier, but animals with horns will get caught if they put their heads through the wire. Smooth or barbed wire can be stretched above the net. These wires should be either less than 2 inches apart or at least 6 inches apart so they will not catch the leg of a jumping deer. Placing a barbed wire near the ground on the outside of the fence will deter some predators from digging under the fence.

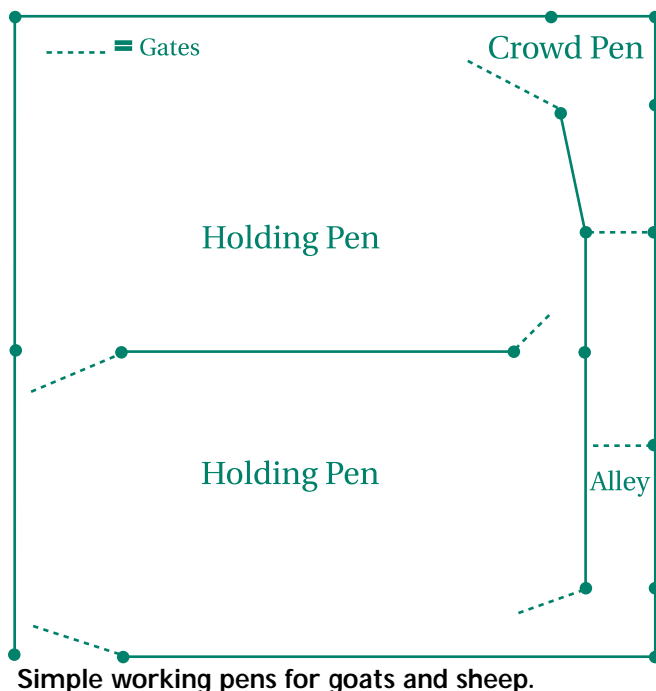
To manage goats or sheep you will need a small pen or corral (see figure). Fences in handling or working pens should be at least 48 inches high. For the safety of people and livestock, barbed wire should **not** be used in working facilities. One pen

large enough to hold the entire herd or flock is required. A smaller crowd pen and alley adjacent to the large holding pen will allow you to handle animals individually. Sides of the crowd pen, alley and the gate entering the crowd pen should be opaque and at least 48 inches high. The alley should be 3 to 4 feet wide; wider alleys allow animals to turn around and move past the handler. By adding a gate opening to the outside on the small end of the alley, the alley can also be used as a loading chute when transporting animals.

The least expensive way to transport goats or sheep is to use a cage that slides into the back of a pickup. Such a cage can hold eight to ten young animals or five to six grown females at one time. If a loading ramp is not available, animals must be lifted into the pickup bed. If you are unable to lift heavy objects, a trailer is the best option.

A 12- to 16-foot bumper pull stock trailer can be pulled with a $\frac{1}{2}$ -ton (or larger) pickup. When loading a trailer, make sure small animals do not go under the trailer and escape. A trailer is relatively expensive, and you might not use it often, so you might consider partnering with a neighbor to purchase one.

The only other facility needed for goats or sheep is shelter from bad weather. Dense stands of brush, especially juniper, provide adequate protection. If you must construct a shelter, all that is needed is a simple structure with a 4- to 7-foot-high roof and solid walls on the north and west sides. Allow 10 to 12 square feet of sheltered area per mature animal in the herd. Consider building portable shelter. Shelters built on skids can be moved where needed or transported to another location. It is a good practice to move a shelter to a clean location periodically, and allow sunlight to disinfect the previous site.



Purchasing Breeding Stock

Novice buyers often pay too much for livestock, purchase poor quality stock, or both. Do some research ahead of time. Subscribe to and read industry publications. Find people you can trust. Talk to trained professionals. Visit with breeders. They can be valuable sources of information. When you purchase from a breeder, you can see and evaluate the parent animals, determine the pedigree, and learn about the environmental, handling, health and nutritional conditions in which the animals have been raised.

Young animals (weaning to 1 year old) are usually less expensive than mature, producing animals. The trade-off is the delay before you have a marketable product. If mature, bred females were purchased, kids/lambs could be of marketable size in as little as 4 months. If weaned females 4 to 6 months old were purchased, it would be at least 10 to 12 months before offspring were marketable.

Health Care

After predators, internal parasites are the next biggest threat to a goat or sheep enterprise. The primary gastrointestinal parasite is *Haemonchus contortus*, commonly called the stomach worm. There are only a few oral medications that control this pest, and *H. contortus* has become resistant to some of them.

Another health problem related to parasites is coccidiosis. Microscopic coccidia are present in the intestines of almost all goats and sheep. When animals are stressed by sudden weather changes, weaning, abrupt changes in diet, etc., the parasites can explode in numbers. Coccidiosis is seldom a problem in mature animals or animals grazing pasture. High risk animals can be given a coccidiosis preventative such as decoquinate or monensin mixed with commercially prepared feed.

Like coccidia, the bacteria *Clostridium perfringens* type C&D are always present in the intestines of sheep and goats. When animals are under stress, the bacteria can cause enterotoxemia (also known as overeating). A toxin produced by the bacteria causes illness and often kills the animal. Young animals should be vaccinated as soon as they begin to eat solid feed. Most vaccines should be followed by a booster 14 to 21 days later.

Consult your veterinarian for help in setting up a program to manage parasites and other health problems.

Breeding

The gestation period for goats and sheep is 150 days, so it is possible to have two kid/lamb crops each year. With a continuous mating system it is likely that there will be three crops in a 24-month period. Reproduction is affected by day length—as day length gets shorter, breeding activity increases. The period of greatest activity is from September through December.

The estrous cycle for does and ewes is 21 days. Therefore, the breeding season should be at least 45 days. The ratio of males to females is important. Mature males can easily breed 50 females in a season, but more than that is not recommended. Young males (less than 18 months old) should not be exposed to more than eight to ten females at a time or more than 25 to 30 females over a 60-day breeding season.

Kidding/lambing time requires intensive labor to ensure maximum survival of the offspring. Bred females should be observed both morning and evening. They occasionally need help during the birthing process. The observant producer is available to give this help and to provide special care for weak newborns.

Nutrition

As previously mentioned, the stocking rate and the availability of forage largely determine the nutritional status of grazing animals. If the amount of forage you have is balanced with the number of animals you are grazing, there may be little need for supplemental feed. Sometimes, though, forage quality is poor, especially during the winter or during a drought. Then supplemental feeding may be required. A mature animal is usually given $\frac{1}{2}$ to 2 pounds of supplemental feed per day, depending on the nutrient deficiency and the type of feed used.

Some small acreage producers choose to have more animals than the pasture could possibly support. In such cases, the first priority should be to provide hay as a substitute for forage. If the hay is fair to poor quality, other supplemental feed may be needed as well.

Marketing and Economics

Mature commercial meat goats and hair sheep cost from \$50 to \$500 per head, depending on quality. The cost of maintaining the breeding herd or flock (including feed, hay and health care costs) can vary widely. Profitability largely depends on the animals' reproductive performance. Table 2 shows the importance of "percent kid/lamb crop." If each female weans one offspring per breeding, you have a 100 percent kid/lamb crop for each breeding season. If your herd has two breeding cycles per year, your kid/lamb crop would be 200

The Relationship of Reproductive Performance to Net Income.

% kid/lamb crop**	Production expense, \$/mature female*				
	10	20	30	40	50
	Expected net income (or loss), \$/mature female***				
40	4	(6)	(16)	(26)	(36)
60	11	1	(9)	(19)	(29)
80	18	8	(2)	(12)	(22)
100	25	15	5	(5)	(15)
120	32	22	12	2	(8)
140	39	29	19	9	(1)
160	46	36	26	16	6
180	53	43	33	23	13
200	60	50	40	30	20

* Example: feed, hay, health care.

** % crop = number of offspring weaned ÷ number of females exposed for breeding.

*** Assumed weaning weight = 50 pounds.

Assumed market price = 70 ¢ per pound live weight.

Shaded area represents negative net income.

percent per year. The higher your production cost, the more kids/lambs you must produce for your enterprise to be profitable.

Production expenses are those expenditures directly associated with the livestock enterprise, such as feed, hay, health supplies and veterinary services. Capital expenses such as facilities, fences, equipment, water system maintenance, utilities and hired labor are important, but not included in the production expense figures in the table.

Kids and lambs are usually weaned at 4 to 6 months of age (45 to 70 pounds). Animals not kept for breeding are typically marketed at this time. Note that the profit/loss predictions in the table are based on a 50-pound market weight and a 70¢-per-pound live weight market price. Generally, heavier animals sell for less per pound, but of course command more dollars per head. Since 1990, the market price for kids and lambs has ranged from \$0.50 to \$1.20 per pound live weight. Prices are cyclical within the year, influenced by religious and ethnic

holidays and the price and availability of imported lamb and goat meats. Prices usually are lowest from July 1 through mid-November, improve from mid-November through the first of the year, and reach their annual high just before Easter.

Kids and lambs can be sold through commission companies, at flea markets or road-side stands, or directly from the farm or ranch.

Conclusion

While it is not likely that you will enjoy huge profits from livestock production on a small acreage, these enterprises, if managed properly, should qualify your land for the agricultural exemption from ad valorem taxes. Remember, though, that land ownership is a privilege that requires us to take good care of our precious natural resources. The Texas Agricultural Extension Service has the following resources to help you:

Web Sites

Extension Animal Science

<http://animalscience-extension.tamu.edu>

Extension Rangeland Ecology & Management

<http://cnrit.tamu.edu>

TEXNAT

<http://texnat.tamu.edu>

Publications of the Texas Agricultural Extension Service

<http://agpublications.tamu.edu>

Related Extension Publications

(available through your county Extension office or the web site above):

B-6037 What Range Herbivores Eat - and Why

L-5152 Understanding Forage Intake in Range Animals

L-5097 Reference Guide for Texas Ranchers

B-6036 Why Range Forage Quality Changes

B-6074 Juniper Biology and Management in Texas

L-5024 Range Condition: Key to Sustained Ranch Productivity

L-5002 Impact of Grazing Management on Non-point Source Pollution

L-5029 Improving Rainfall Effectiveness on Rangeland

B-1646 How Much Forage Do You Have?

B-1606 Balancing Forage Demand with Forage Supply

B-6072 Toxic Plant Handbook

B-5021 Spanish Goat Management

L-5094 Monitoring Internal Parasite Infection in Small Ruminants

L-5095 A *Haemonchus contortus* Management Plan for Sheep & Goats in Texas

Call (979) 845-6573 for current prices and ordering instructions for the following:

Texas Beef Cattle Management Handbook

Texas Range Management Handbook

Produced by AgriLife Communications and Marketing, The Texas A&M University System
Texas AgriLife Extension publications can be found on the Web at: <http://AgriLifebookstore.org>

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Revision